



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/942,445

08/30/2001

Toshimichi Kurihara

14872

7920

23389

7590

02/29/2008

SCULLY SCOTT MURPHY & PRESSER, PC

400 GARDEN CITY PLAZA

SUITE 300

GARDEN CITY, NY 11530

EXAMINER

SCHILLINGER, LAURA M

ART UNIT

PAPER NUMBER

2813

MAIL DATE

DELIVERY MODE

02/29/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TOSHIMICHI KURIHARA and TAKASHI UEDA

Appeal 2007-4429
Application 09/942,445¹
Technology Center 2800

Decided: February 28, 2008

Before KENNETH W. HAIRSTON, SCOTT R. BOALICK,
and MARC S. HOFF, *Administrative Patent Judges*.

BOALICK, *Administrative Patent Judge*.

DECISION ON APPEAL

¹ Application filed August 30, 2001. The real party in interest is NEC Compound Semiconductor Devices, Ltd.

This is an appeal under 35 U.S.C. § 134(a) from the final rejection of claims 1, 3, 5, 7, 9, 11, 13, 15, 22, and 24.² We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

STATEMENT OF THE CASE

Appellants' invention relates to a semiconductor device having a resin-sealed package equipped with a radiating plate. (Spec. 1:8-10.)

Claim 1 is exemplary:

1. A semiconductor device comprising:
 - a radiating plate;
 - a semiconductor chip bonded onto the radiating plate;
 - a rectangular-shaped resin wall which surrounds the semiconductor chip bonded to the radiating plate, said rectangular-shaped resin wall having a first pair of opposing sides and a second pair of opposing sides;
 - a conductive member extending through one of the first pair of opposing sides of the resin wall and retained by the resin wall, said conductive

² Claims 2, 4, 6, 8, 10, 12, 14, 16, 18, 23, and 25 have been cancelled, claims 19-21 have been withdrawn from consideration, and claim 17 has been objected to as being dependent upon a rejected base claim, but has been indicated to be allowable if rewritten in independent form.

member is electrically connected to the semiconductor chip; and

a resin lid bonded to an upper end of the resin wall, said semiconductor chip is sealed in a space enclosed by said radiating plate, said resin wall and said resin lid, said radiating plate extends outward of said second pair of opposing sides of said resin wall.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Switky	US 5,270,262	Dec. 14, 1993
Yamauchi	US 5,266,739	Nov. 30, 1993

Claims 1, 3, 5, 7, 9, 11, 13, 15, 22, and 24 stand rejected under 35 U.S.C. § 103(a) as being obvious over Switky and Yamauchi.

Rather than repeat the arguments of Appellants or the Examiner, we make reference to the Briefs and the Answer for their respective details. Only those arguments actually made by Appellants have been considered in this decision. Arguments that Appellants did not make in the Briefs have not been considered and are deemed to be waived. *See* 37 C.F.R.

§ 41.37(c)(1)(vii).³

³ Except as will be noted in this opinion, Appellants have not presented any substantive arguments directed separately to the patentability of the dependent claims or related claims in each group. In the absence of a separate argument with respect to those claims, they stand or fall with the representative independent claim. *See* 37 C.F.R. § 41.37(c)(1)(vii).

ISSUE

The issue is whether Appellants have shown that the Examiner erred in rejecting the claims under 35 U.S.C. § 103(a). That is, given the teachings of the prior art, have Appellants shown that the differences between the claims and the prior art are sufficient to render the claimed subject matter unobvious to a person skilled in the art at the time the invention was made?

FINDINGS OF FACT

The record supports the following findings of fact (FF) by substantial evidence.

1. Switky describes a molded plastic package with a cavity for accommodating a semiconductor chip. (Abstract; col. 1, ll. 8-10; Figs. 1, 2, 3A, 3B, 3C, and 5-9.) The package is created using a pair of relatively rigid plates as the upper and lower surfaces. (Col. 2, ll. 34-36; col. 3, ll. 64-67; col. 5, ll. 51-53.) The "plates can be made of any suitably rigid material." (Col. 2, ll. 36-37.) The plates are spaced apart by a resilient insulating ring (also called a resilient plastic bead 15 or an O-ring) that surrounds the chip bonding pad 17 and is smaller than the plates 11, 14 so that it is located inside the edges of the plates 11, 14. (Col. 2, ll. 40-42; col. 4, ll. 20-26; col. 6, ll. 15-18.) The chip 16 may be attached to the bonding pad 17 or attached directly to the

bottom plate 14. (Col. 5, ll. 25-26.) A plastic ring 12 is molded around the edges of the plates 11, 14. (Col. 2, ll. 57-58.) The plastic bead 15 prevents the ingress of molded plastic and forms a cavity around the semiconductor chip along with the plates 11, 14. (Col. 2, ll. 60-63; col. 7, ll. 31-34.) Leads 13 pass through the plastic ring 12. (Col. 3, ll. 55-57.) As shown in Fig. 5, fingers 21 may include holes 23 which are located outside of plastic bead 15. (Col. 6, ll. 21-23.)

2. Yamauchi describes a chip electronic device where an electronic element is covered with a resin housing. (Abstract; Figs. 2-5, 7.) Resin is injected into a mold to form a housing 16. (Col. 2, ll. 66-67.)

PRINCIPLES OF LAW

All timely filed evidence and properly presented arguments are considered by the Board in resolving an obviousness issue on appeal. *See In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984).

In the examination of a patent application, the Examiner bears the initial burden of showing a prima facie case of unpatentability. *Id.* at 1472. When that burden is met, the burden then shifts to the applicant to rebut. *Id.*; *see also In re Harris*, 409 F.3d 1339, 1343-44 (Fed. Cir. 2005) (finding rebuttal evidence unpersuasive). If the applicant produces rebuttal evidence of adequate weight, the prima facie case of unpatentability is dissipated. *In re Piasecki*, 745 F.2d at 1472. Thereafter, patentability is determined in view of the entire record. *Id.* However, on appeal to the Board it is an

appellant's burden to establish that the Examiner did not sustain the necessary burden and to show that the Examiner erred. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) ("On appeal to the Board, an applicant can overcome a rejection [for obviousness] by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.") (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)).

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007).

In *KSR*, the Supreme Court reaffirmed that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* at 1739. The Court explained:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious

unless its actual application is beyond his or her skill.

Id. at 1740. The Court also explained that:

[o]ften, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

Id. at 1740-41. The Court noted that "[t]o facilitate review, this analysis should be made explicit." *Id.* at 1741 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness")). However, "the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *Id.* The Court cautioned that "[a] factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning." *Id.* at 1742.

The level of ordinary skill in the art may be evidenced by the prior art references. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) ("Although the Board did not make a specific finding on skill level, it did conclude that the level of ordinary skill in the art . . . was best determined by appeal to the references of record We do not believe that the Board clearly erred in adopting this approach."); *see also In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978) ("the PTO usually must evaluate both the scope and content of the prior art and the level of ordinary skill solely on the cold words of the literature").

During examination of a patent application, a claim is given its broadest reasonable construction consistent with the specification. *In re Prater*, 415 F.2d 1393, 1404-05 (CCPA 1969). "[T]he words of a claim 'are generally given their ordinary and customary meaning.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (internal citations omitted). The "ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Id.* at 1313.

ANALYSIS

Appellants contend that the Examiner erred in rejecting claims 1, 3, 5, 7, 9, 11, 13, 15, 22, and 24 as being obvious over Switky and Yamauchi. Reviewing the documents of record and the findings of facts cited above, we

do not agree that the Examiner erred in rejecting claims 1, 3, 5, 7, 9, 11, 13, 15, and 24. In particular, we find that the Appellants have not shown that the Examiner failed to make a prima facie showing of obviousness with respect to these claims. Appellants failed to meet the burden of overcoming that prima facie showing. However, we agree with Appellants that the Examiner erred in rejecting claim 22 as being obvious over Switky and Yamauchi.

Claim 1

Appellants argue that Switky does not teach a rectangular-shaped resin wall. (App. Br. 9-11; Reply Br. 2-3.) In particular, although Appellants admit that the plastic bead 15 follows a rectangular path around the perimeter of the chip pad 17 (Reply Br. 2), Appellants argue that the plastic bead 15 of Switky has an oval-shaped cross-section and not a rectangular-shaped cross-section. We do not find this argument persuasive.

The plain language of claim 1 requires a "rectangular-shaped resin wall which surrounds the semiconductor chip bonded to the radiating plate." In other words, the claim merely requires the resin wall to have a rectangular shape, not a rectangular-shaped cross-section. Claim 1 is silent as to any required cross-sectional shape of the resin wall. Under a reasonable interpretation of claim 1, a resin wall that defines a rectangular path would satisfy the recited "rectangular-shaped resin wall" limitation. As the Examiner correctly found (Ans. 3, 5; FF 1), Switky teaches that the plastic bead 15 is formed in a rectangular pattern that surrounds the chip pad 17,

and therefore meets the "rectangular-shaped resin wall which surrounds the semiconductor chip" limitation of claim 1.

Appellants argue that the plastic bead 15 cannot be construed as a "wall" because it is used as a sealant and "lacks the structural rigidity to act as a wall." (Reply Br. 2-3.) We do not agree. We find no requirement for structural rigidity in the language of claim 1. The plastic bead 15 of Switky seals the area between the top plate 11 and bottom plate 14 (col. 5, ll. 60-63), and thus fully meets the claimed "wall" limitation.

Appellants also argue that Switky fails to teach a conductive member extending outward of a first pair of opposing sides and a radiating plate extending outward of a second pair of opposing sides, as claimed. (App. Br. 10.) We do not agree. As the Examiner correctly found, Switky teaches that conductive members 13 extend through two opposing sides of the resin wall 15 and the radiating plate 14 extends outward of a second pair of opposing sides of the resin wall 15. (Ans. 4-6; FF 1).

Next, Appellants argue that the resin lid of Yamauchi is different than the recited resin lid bonded to an upper end of the resin wall because Yamauchi teaches that a resin housing is molded around an electrical component and physically contacts the component. (Reply Br. 3-4.) Appellants also contend that the combination of Switky and Yamauchi is improper. (Reply Br. 3-4.) We do not agree.

Instead, we agree with the Examiner that, by teaching an electronic device where an electronic element is covered with resin, Yamauchi teaches a resin lid. (Ans. 4; FF 2.) The Examiner cited Yamauchi for the teaching

of a resin lid, and we agree that Yamauchi teaches that it was well within the level of ordinary skill in the art at the time of the invention to make a package, including a lid, using resin, with no unexpected results. (FF 2.) Furthermore, we find no error in combining the resin lid of Yamauchi with the semiconductor package of Switky. The combined teachings of Switky and Yamauchi show that Appellants have done no more than combine familiar elements according to known methods, with no unexpected results.

Accordingly, we conclude that Appellants have not shown that the Examiner erred in rejecting claim 1 under 35 U.S.C. § 103(a).

Claims 7, 9, and 11

Appellants have argued claims 7, 9, and 11 together as a group. (App. Br. 11.) Thus, in accordance with 37 C.F.R. § 41.37(c)(1)(vii), we select claim 7, the broadest claim, as representative.

Appellants argue that Switky does not disclose or suggest second holes in the region extending through the resin wall of the conductive member. (App. Br. 11.) However, that argument is not commensurate with the scope of claim 7. Claim 7 does not recite "second holes." Instead, claim 7 recites only that "holes are provided in the conductive member and said holes are located in the outside portions of the resin wall on the conductive member."

In the Reply Brief, Appellants also argue that Switky does not disclose or suggest first holes located in the outside positions of the resin wall on the conductive member because the holes 23 provided in the

leads 13 extend through the plastic encapsulant 12 and are not outside of the plastic encapsulant 12. (Reply Br. 4-5.) However, as Appellants admit (App. Br. 11) and the Examiner correctly found (Ans. 4), the holes 23 of Switky are located outside of the plastic bead 15. (FF 1; Switky Fig. 5.) As discussed, we agree with the Examiner that the plastic bead 15 corresponds to the recited "resin wall." Therefore, Switky teaches holes in the conductive member as recited in claim 7.

Accordingly, we conclude that Appellants have not shown that the Examiner erred in rejecting claim 7 under 35 U.S.C. § 103(a). Claims 9 and 11 were argued as a group with claim 7, and fall together with claim 7.

Claim 22

With respect to claim 22, we agree with Appellants that neither Switky nor Yamauchi teach or suggest the limitation of the lower end of the resin wall being bonded to the center of the radiating plate, as claimed. (App. Br. 12.) Instead, Switky discloses a radiating plate 14 with the plastic bead 15 bonded at the *ends* of the plate 14. (Figs. 2, 3A, 3B, 3C.) Although Switky teaches that the drawings are not to scale (col. 3, ll. 16-17) and that the plastic bead 15 is located inside the edge of the upper plate 11 and lower plate 14 (col. 6, ll. 15-18; *see also* col. 2, ll. 43-45), we do not find this to be a teaching or suggestion that the plastic bead 15 is located at the *center* portion of radiating plate 14. In addition, there is no evidence before us to show that this limitation is a predictable variation of the prior art. Nor is

there evidence before us to show that this limitation would be common sense or a creative step that a person of ordinary skill in the art would employ.

Therefore, we conclude that Appellants have shown that the Examiner erred in rejecting claim 22.

Claims 3, 5, 13, 15, and 24

Although Appellants nominally argue the rejection of dependent claims 3, 5, 13, 15, and 24 separately (App. Br. 12), the arguments presented do not point out with particularity or explain why the limitations of the dependent claims are separately patentable. Instead, Appellants summarily allege that these claims "are allowable for all of the reasons as the claims on which they depend." (App. Br. 12.) Because Appellants have not persuasively rebutted the Examiner's prima facie case of obviousness for dependent claims 3, 5, 13, 15, and 24 based on the teachings of Switky and Yamauchi, we will sustain the rejection of claims 3, 5, 13, 15, and 24 for the reasons discussed with respect to independent claim 1, from which claims 3, 5, 13, 15, and 24 depend.

CONCLUSION OF LAW

Based on the findings of facts and analysis above, we conclude that:

(1) Appellants have not shown that the Examiner erred in rejecting claims 1, 3, 5, 7, 9, 11, 13, 15, and 24 for obviousness under 35 U.S.C. § 103.

(2) Appellants have shown that the Examiner erred in rejecting claim 22 for obviousness under 35 U.S.C. § 103.

DECISION

The rejection of claims 1, 3, 5, 7, 9, 11, 13, 15, and 24 for obviousness under 35 U.S.C. § 103 is affirmed.

The rejection of claim 22 for obviousness under 35 U.S.C. § 103 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

gvw

SCULLY SCOTT MURPHY & PRESSER, PC

Appeal 2007-4429
Application 09/942,445

400 Garden City Plaza, Suite 300
Garden City, NY 11530